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BYZANTINE COMMENTARIES ON DIOSCORIDES

JOHN M. RIDDLE

In the mid-first century, Dioscorides had written "And some have recorded that if someone were to bury rams' horns broken into small pieces, asparagus grows,"[1] but a Byzantine scribe, living no later than the fourteenth century, simply could not accept this assertion. Reacting strongly, he wrote, "it seems incredible to me" (ἐμοὶ δὲ ἀπίθανον).[2] Thereafter the texts of at least ten Dioscorides Greek manuscripts incorporated the phrase into the chapter on this common vegetable.[3] This added comment must have appeared strange to later readers, confronted by "Dioscorides" expressing skepticism about what he had just written, and doing so in the first person.

Having interrupted Dioscorides with his own doubt, the scholiast decided to add new material to Dioscorides' pharmaceutical descriptions of asparagus. Dioscorides had set down the following about the plant:

> Growing in rocky soil, asparagus or "spiky-mushroom,"[4] which some term a sage,[5] has a stalk which boiled and eaten softens the bowels and is also a diuretic. When drunk, the decoction of its roots is helpful for those having difficulty micturating, and for those afflicted by jaundice or sciatica; when decocted with wine, the roots are helpful for those bitten by a poisonous spider (φαλάγγιον),[6] and those suffering from toothache are benefited when the decoction is applied to the painful tooth. Also asparagus seeds made into a drink provide the same effects [as the root decoction]. And also they say that dogs die after they have drunk the decoction of asparagus.[7] And some have recorded that if someone were to bury rams' horns broken into small pieces, asparagus grows.[8]

The commentator added, "it seems incredible to me," even though the tenth-century Byzantine compilation of agricultural lore, the *Geoponica*, had honored the same tradition as follows:

> If one wants to produce an abundance of asparagus, chop up (κόψας) wild rams' horns into small pieces, throw them onto the [asparagus] beds, and water. Some say even more incredibly (παραδοξότερον) that if whole rams' horns are bored and laid down, they will bear asparagus.[9]

[The reader is referred to the list of abbreviations at the end of the volume.]

[1] Dioscorides II, 125 (ed. Wellmann, Vol. I, p. 198).

[2] *Ibid.*, *apparatus criticus* to line 2.

[3] I have noted the commentary in the following manuscripts (an asterisk indicates the manuscripts used by Wellmann): Leiden, Bibl. Univ., MS Voss Gr. F. 58, 14th cent.; *Vatican, MS Palatinus gr. 77, 14th cent.; Paris, B.N., MS gr. 2182, anno 1481; *Paris, B.N., MS gr. 2183, 15th cent.; Salamanca, Bibl. univ. MS 2659 (formerly *Madrid, MS palat. Reg. 44), 15th cent.; *Venice, San Marco, MS Gr. Z 271, 15th cent.; Venice, San Marco, MS Gr. Z. 272, 15th cent.—Michael Apostoles, scribe; Venice, San Marco, MS Gr. Z. 597, 15th cent.; El Escorial, MS T–II–12, 16th cent. Generally throughout I shall not give foliation. While I have seen all these manuscripts, I normally follow Wellmann's critical apparatus and list the manuscripts which have the commentary and were not included by Wellmann. My expanded list includes those I studied and in which I observed the particular scholium; therefore, the actual number of texts with the scholium under discussion will probably be larger than what is recorded in this article. Still, the number of manuscripts will be greater than known by Wellmann.

[4] This translation of μυάκανθος is offered as an approximation of what appears to be the meaning suggested by Dioscorides' sources. The literal roots of the term suggest both a "mouse" and a "mushroom." R. Strömberg, *Griechische Pflanzennamen* (Göteborg, 1940), 28; Alexander of Tralles IX, 1 (ed. Puschmann, Vol. II, p. 395), and Dioscorides III, 151, and IV, 143.2 (ed. Wellmann, Vol. II, pp. 159 and 287), show that this name (μυάκανθος) was given to the shoots of butcher's broom (*Ruscus aculeatus* L.), which explains why Dioscorides would say some call it a "sage"—even though ὅρμινον is definitely another plant.

[5] Ὅρμινον is probably red-topped sage (*Salvia horminum* L.), considered separately by Dioscorides (III, 129). The plant certainly does not resemble asparagus.

[6] For a discussion of the identities of this venomous spider, see Scarborough, "Nicander II," 7–14.

[7] According to Pliny, *Natural History* XX, 43.111, the assertion that asparagus will kill dogs was made by Chrysippus (4th cent. B.C.). See *RE*, Vol. III, pt. 2 (Stuttgart, 1899), cols. 2509–10.

[8] Dioscorides II, 125 (ed. Wellmann, Vol. I, pp. 197–98).

[9] *Geoponica* XII, 18.2–3 (ed. Beckh, p. 365).

It is quite probable that the Byzantine scholiast was well aware of this venerable "rams' horns" custom for cultivators of asparagus—quite similar to modern gardeners in their adding bone meal to certain vegetable plots—but the commentator has chosen to supplement Dioscorides with a botanical morphology very much in keeping with the pattern of description laid down by Theophrastus,[10] and then to add further pharmacological details about asparagus:

> Be that as it may (μέντοι), this asparagus shrub is multibranched, has many leaves, and is large, and is similar to fennel.[11] The roots are rounded off, are large, and have a knob, and their stalks, made soft with white wine, abate phrenitis.[12] Taken either boiled or baked, they slake strangury, difficulty in micturation, and dysentery. Boiled down in vinegar or wine, the roots alleviate sprains; taken boiled with figs and chickpea,[13] they cure jaundice and alleviate sciatica and strangury. Hung as an amulet and drunk as a decoction, the root causes barrenness (ἀτοκία) and sterility (ἄγονος).[14]

The Byzantine commentator has added a botanical description, frequently omitted by Dioscorides, especially for common plants. Unlike the scribe's classical model Theophrastus, Dioscorides normally provided topical habitats, information probably helpful for finding it in the wild. The commentator properly terms asparagus a "shrub" because it grows to a height of one and one-half meters. He says that it is multibranched, and calls the leaves "large," somewhat inaccurate by modern botanical morphology: technically, according to modern botany, asparagus has no leaves, simply modified branchlets which serve that morphological function. The scribe, however, likens asparagus leaves to fennel leaves. The modern botanist would state that fennel (*Foeniculum vulgare* Miller) has true leaves, much divided and feathery, but the casual observer could easily compare fennel leaves with those of asparagus.

The commentator's purpose in supplementing Dioscorides' text was therapeutic, not botanical, and one may assume that he was attempting to explicate the medical and pharmacological properties of asparagus, as contrasted to their fusion with farm lore, seen both in Dioscorides and the abridgment of Didymus in the *Geoponica*. The scholiast adds medicinal employment for phrenitis, dysentery, and sprains, and the use of asparagus as an antifertility agent. There is repetition: he repeats Dioscorides and he repeats himself. Dioscorides had said that the root was good for those with difficulty in micturation, and the Byzantine commentator repeats this twice and adds the affliction called strangury, a painful and interrupted urination in drops, produced by spasmodic muscular contraction of the ureter and bladder. Asparagus remains a strongly recommended diuretic in folkmedicine.[15] Dioscorides had prescribed a boiling of the root, and the scholiast has added "or baking." Lest one conclude too quickly from the skepticism about ram's horn growing into asparagus that the Byzantine scribe was more "rational" than Dioscorides, one should note his statement of asparagus' use as an amulet: the scholiast has included the amuletic asparagus without Dioscorides' manner of disclaiming folklore with such phrases as "they say" and "it is reported."

The final aspect of the scribe's additions is the use of asparagus as an antifertility agent. Curiously, a Hippocratic work suggests that asparagus seeds are to be used in a pessary to promote conception, not contraception.[16] In 1952, Russian investigators reported that a decoction of asparagus (*A. acutifolius officinalis*) was used in folkmedicine for its contraceptive effect.[17] While asparagus has asparagin, an amino acid, its use for the regulation of fertility cannot be verified.[18] In 1975, however, the *Journal of Pharmaceutical Sciences* published an article which suggested asparagus as a future can-

[10] Schol. Dioscorides II, 125 (ed. Wellmann, Vol. I, p. 198: *app. crit.* to line 2, lines 1–2). Cf. Theophrastus, *HP* I, 3.1.

[11] *Foeniculum vulgare* Miller. Cf. Theophrastus, *HP* I, 11.2.

[12] φρενῖτις. LSJ, *s.v.* wrongly defines this as "inflammation of the brain," whereas the cited texts show an inflammation of the diaphragm. Berendes, in translating Dioscorides (p. 222), included the commentary as part of Dioscorides' text, and interpreted the meaning as an affliction of the bladder or spleen. A long discussion of phrenitis is given by Caelius Aurelianus, *On Acute Diseases* Bk. I (ed. and trans. Drabkin), who certainly included febrile delirium and several psychotic states within the meaning of phrenitis. One of the better discussions on the φρένες among the Greeks is R. B. Onians, *The Origins of European Thought* (Cambridge, 1951), esp. 13–15, 23–28, 29–32, 37–40, and 116–17.

[13] *Cicer arietinum* L.

[14] Schol. Dioscorides II, 125 (ed. Wellmann, Vol. I, p. 198: *app. crit.* to line 2, lines 1–8).

[15] W. Schneider, *Lexikon zur Arzneimittelgeschichte* (Frankfurt, 1974; 7 vols.), Vol. V, pt. 1, 147–49.

[16] The Hippocratic *Diseases of Women* I, 75 (ed. Littré, Vol. VIII, p. 166). Cf. J. H. Dierbach, *Die Arzneimittel des Hippokrates* (Heidelberg, 1824; rptd. Hildesheim, 1969), 20.

[17] V. J. Brondegaard, "Contraceptive Plant Drugs," *Planta Medica*, 23, 2 (1973), 169.

[18] P. G. Stecher, *et al.*, eds., *The Merck Index*, 8th ed. (Rahway, New Jersey, 1968), 106–7; J. E. Driver and G. E. Trease, *The Chemistry of Crude Drugs* (London, 1928), 8.

didate for the testing of antifertility agents in natural products.[19] Aside from the possible effectiveness of asparagus as a contraceptive, it is important to note that the Byzantine commentator has recorded data otherwise unknown to us, either from earlier authorities now lost, or as testimony of contemporary late Byzantine medical pharmacognosy.

Commentaries and scholia on Dioscorides are rather common in the manuscript traditions. The famous alphabetical Greek codex of c. A.D. 512, the so-called Anicia Juliana, contains numerous scholia and commentaries, but the Anicia Juliana is excluded from consideration in this study because there exists a good scholarly literature on the commentaries to the Vienna codex.[20] The concentration in this study is on later manuscripts, since many preserve Dioscorides' original (non-alphabetical) order and have fewer alterations than found in the Anicia Juliana and the later Greek texts which descend from it. Wellmann, in the critical apparatus to his edition of the Greek text of Dioscorides' *Materia medica*, faithfully recorded most of the scholia and commentaries in the manuscripts he employed to establish his text, but Wellmann used less than half of the Greek manuscripts of Dioscorides now known to be extant. For example, the earliest manuscript employed by Wellmann for the asparagus scholium is Vatican Palatinus MS graec. 77 (fourteenth century). One other manuscript is at least as early as the Palatine, and it was not known to Wellmann: the marvellously illustrated manuscript at Padua's seminary library (MS 194).[21] The scribe or scribes of the Padua manuscript use the text and iconographical tradition of the Anicia Juliana, but when the plants beginning with the letter *Omega* are reached, the scribes show awareness of another Dioscorides text with its own set of illuminations. Thus, the scribes start over with *Alpha* and go again through *Omega*. In this second text, the copyists include plants omitted in the initial manuscript, and the second text contains substantially different readings in many instances. It is in the second copying that the scribes of the Paduan manuscript include the additional material on asparagus, significantly by using a Greek text far less corrupted than that represented by the Anicia Juliana and its descendants. Since the Paduan manuscript did not employ the non-illustrated Palatine text, it is clear that both of these fourteenth-century manuscripts had a common source for the scholia on asparagus.

Wellmann's stemma stands in need of revision, but until this arduous task is performed, one may make general assumptions concerning the commentaries and scholia to Dioscorides by observing when they appear in the manuscripts. Since there are a variety of styles, forms, and quality of comments in the scholia, and since the commentaries are in various combinations of manuscript families, one may assume that there were certain scribes who hoped to supply addenda or corrections to the Greek texts of Dioscorides. Both the Byzantine Greek vocabulary and the dates of the manuscripts which contain commentaries show that most scholia were appended after the tenth century but not later than the fourteenth. Consequently, these Byzantine commentaries and scholia indicate numerous facets about the nature and quality of Byzantine medicine.

Generally, the commentaries were attached at the conclusions of Dioscorides' chapters, and most of them consider therapeutics. In one instance, Dioscorides had written about a plant called γιγγίδιον, probably a species of wild carrot, *Daucus gingidium* L.,[22] as follows:

> It grows plentifully in both Cilicia and Syria, a little herb like the wild carrot (σταφυλῖνος = *Daucus carota* L. [*D. guttatus* Sibthorp])[23] but thinner and more bitter; its root is somewhat white, pungent. It is grown as a pot herb, eaten raw, and boiled and pickled. It is good for the upper digestive tract, and is diuretic.[24]

To which a copyist adds:

> boiled down and drunk with wine, it is useful for the bladder.[25]

At least eight manuscripts subsequently integrated

[19] N. R. Farnsworth, *et al.*, "Potential Value of Plants as Sources of New Antifertility Agents. I," *Journal of Pharmaceutical Sciences*, 64, 4 (1975), 544.

[20] There are two facsimile printings, each with lengthy commentaries: J. de Karabacek, ed., *De codicis Dioscuridei Aniciae Iulianae, nunc Vindobonensis Med. Gr. I* (Leiden, 1906; 4 vols.); and H. Gerstinger [Kommentarband zur Faksimileausgabe (1970)], *Dioscurides Codex Vindobonensis med. gr. 1 der Österreichischen Nationalbibliothek* (Graz, 1965–1970; 5 vols.). See also O. Mazal, *Pflanzen, Wurzeln, Säfte, Samen: Antike Heilkunst in Miniaturen des Wiener Dioskurides* (Graz, 1981). For a partial bibliography, see J. Riddle, "Dioscorides," in *Catalogus*, 14–15.

[21] See E. Mioni, "Un novo erbario greco di Dioscoride," *Ressegna Medica. Convivum Sanitatis* [Milan], 36 (1959), 169–84.

[22] Berendes, trans., *Dioskurides*, p. 228; Carnoy, 130; LSJ, *s.v.*

[23] Berendes, trans., *Dioskurides*, p. 299; Carnoy, 252.

[24] Dioscorides II, 137 (ed. Wellmann, Vol. I, pp. 208–9).

[25] Schol. Dioscorides II, 137 (ed. Wellmann, Vol. I, p. 209: *app. crit.* to line 3).

the new line into Dioscorides' chapter.[26] From the view of pharmacological chemistry, the carrot is not known to have an effect on the bladder,[27] except as a diuretic through the kidneys. Possibly the scholiast intended his addition as an elaboration, but this seems implausible, since the appended data is superfluous. Another reason is more likely. In a chapter on the plant called λεπίδιον, Dioscorides gives γιγγίδιον as its synonymn.[28] Identified either as dittander (*Lepidium latifolium* L.) or broad-leaved pepperwort (*L. sativum* L.) in the family Cruciferae, these pepperworts are in distinct contrast to a carrot in the Diapensiaceae family.[29] It is likely that the Byzantine scholiast thought that γιγγίδιον was pepperwort, and added the line to correct Dioscorides' omission. In the Latin West during the Middle Ages, *lepidium* and *gingidion* were often presumed to be the same plant, a pepperwort,[30] and through the nineteenth century folkmedicine used pepperwort in the treatment of bladder ailments.[31]

In almost half of the manuscripts that contain the scholium on pepperwort,[32] there is an interesting commentary added to Dioscorides' chapter on plantain (*Plantago* spp.):

> The Syrians say that the broth [of plantain], and of the catmint (καλαμίνθη: prob. *Nepeta cataria* L.), with honey, cures the fevers; the broth is given for a quotidian, a quartan, just in a preparation; accept this as some secret talisman (μυστήριον).[33] For this is very true, even through experiences.[34]

These comments are quite distinct from other scholia, since they may be connected with Hermetic literature or other magical texts.[35]

In other instances, Byzantine scholiasts give a classical source as the authority. In his original, Dioscorides had referred to at least two species of plants—by our system of taxonomy—with a single Greek name, ἀσφόδελος, which would include both *Asphodelus ramosus* L., and *A. albus* Miller (a St. Bernard's lily, and white asphodel) in Liliaceae. The following appears in a number of manuscripts:[36]

> Another kind flowers at harvest time. It is necessary to cut the white asphodel during the spring equinox before its fruit increases. It is said that its root taken in a drink creates an appetite for sexual activity.[37] And Crateuas the Rhizotomist said the same thing, and also that the root drunk with wine successfully treats the pain in those who suffer from gout.[38]

These comments are important because if we knew their origin we then would know when a "true" cure for gout was first discovered. Our natural product drug of choice for gout is colchicine, which breaks the chemical chain of excessive uric acid deposits on joint tissue and tophoi.[39] Colchicine is present in asphodel.[40] One needs more data than what ancient, medieval, and Byzantine sources tell us, before there is assurance that this is a cure for gout, and such information would include the concentration of colchicine, particular species, preparation method, and dosages and frequency of administration. Lacking these details, one suspects that pre-modern use of the drug would have been less spectacular than the modern synthesized drug, which gives a clinical response within twenty-four hours. Nevertheless, in all probability, the ancient and Byzantine asphodel preparation for gout would have been effective.

The earliest test of this scholium ends with "an appetite for sexual activity."[41] Later manuscripts add the fragment attributed to Crateuas, who had written a medical tract on root medicine in the second

[26] Leiden, Bibl. Univ. MS Voss G. F. 58, 14th cent.; *Vatican, MS Pal. gr. 77, 14th cent.; *Venice, San Marco, MS Gr. Z. 271, 15th cent.; Salamanca, Bibl. univ. MS 2659, 15th cent.; *Paris, B.N., MS gr. 2183, 15th cent.; Paris, B.N., MS gr. 2182, anno 1481, fol. 62; El Escorial, MS T–II–12, 16th cent.; Paris, B.N., MS gr. 2185, 16th cent., fol. 64.

[27] Carrot juice, however, is sometimes substituted for coffee as a stimulating beverage. Lewis and Elvin-Lewis, 387.

[28] Dioscorides II, 174 (ed. Wellmann, Vol. I, pp. 241–42).

[29] Schneider, *Lexikon* (n. 15 above), Vol. V, pt. 2, 17–19 and 246–48.

[30] H. Fischer, *Mittelalterliche Pflanzenkunde* (Munich, 1929), 273; Schneider, *Lexikon* (n. 15 above), Vol. V, pt. 2, 246–47.

[31] Schneider, *Lexikon* (n. 15 above), Vol. II, 73.

[32] To the three manuscripts identified by Wellmann (Paris 2183, Salamanca 2659, and Venice Z. 272), one adds another in which the scholium also appears (Paris, B.N., MS gr. 2182, fol. 50), but it is not in other codices in which there are scholia already mentioned, e.g. Leiden, MS Voss. Fr. F. 58 (fols. 266^{v}–67 have plantain), El Escorial MS T–II–12, and Venice, San Marco MS Gr. Z. 597.

[33] *PGM*, XII, 331–34 [talisman]. This is also the name of a particular drug, "The Secret," or "The Talisman," as recorded by Galen (ed. Kühn), XIII, 96, quoting Niceratus; cf. Alexander of Tralles V, 4 (ed. Puschmann, Vol. II, p. 161), and Oribasius, *For Eunapius* IV, 135 (ed. Raeder, p. 496).

[34] Schol. Dioscorides II, 126.4 (ed. Wellmann, Vol. I. p. 200: *app. crit.* to line 15).

[35] J. M. Riddle, *Marbode of Rennes' De lapidibus* (Wiesbaden, 1977 [*SA* Beiheft 20]), 3–5, 10, and 28–30.

[36] Leiden, Bibl. univ., MS Voss. Gr. F. 58; *Vatican, MS Pal. gr. 77; Paris, B.N., MS gr. 2182; *Paris, B.N., MS gr. 2183; Paris, B.N., MS gr. 2185; El Escorial, MS T–II–12.

[37] Vatican, MS Pal. gr. 77 ends here.

[38] Schol. Dioscorides II, 169.3 (ed. Wellmann, Vol. I, p. 236: *app. crit.* to line 8).

[39] A. Goth, *Medical Pharmacology*, 9th ed. (St. Louis, 1978), 533–34. Lewis and Elvin-Lewis, 199 and 219.

[40] J. A. Duke, "Phytotoxin Tables," *Critical Reviews in Toxicology* (Nov. 1977), 215.

[41] Schol. Dioscorides II, 169.3 (ed. Wellmann, Vol. I, p. 236: *app. crit.* to line 8 [line 4]).

century B.C.[42] An extensive fragment on asphodel from Crateuas' treatise is preserved in the Anicia Juliana, and the text is separate from that of Dioscorides; the use of asphodel for gout appears in this fragment.[43] The extant texts suggest the following: Crateuas was the first known writer on herbal medicine to recommend an effective remedy for gout, but the drug was not employed by his successors, including Dioscorides.[44] The copyist of the Anicia Juliana manuscript in the early sixth century recognized that Dioscorides' account could be augmented, and so he added the quotation from Crateuas, but in a separate section, clearly identified as a different source. After the citation of the Anicia manuscript, there is no evidence before the fourteenth century that asphodel was used against gout, even by the Byzantine commentator who provides information about its collection and employment as an aphrodisiac. The old Latin translation of Dioscorides (c. sixth century) does not include asphodel as a remedy for gout.[45] It first reappears in extant texts of the late fourteenth century by a Byzantine scholiast who again recognized asphodel as a treatment for gout, and he appended it to a previous commentary on this section of Dioscorides' text. Credit for this rediscovery should be given to this unknown Byzantine scribe, who perceived important data inexplicably lost for 800 years, and added the information to the text of Dioscorides.

In a similar manner, new information is appended to the description of another plant, emerging partially from Crateuas and Galen, but with a possible major innovation. In the chapter on the birthwort (ἀριστολοχεία), Dioscorides had written that there was a third kind (κληματῖτις) with the same pharmaceutical properties as the other two (probably *Aristolochia pallida* Willd., and *A. sempervirens* L.), but this third kind was not as strong.[46] Some Byzantine scholiasts were not satisfied by this terse description, and chose to elaborate on what is probably our *Aristolochia clematitis* L.:

> [The *klēmatitis*] is called by some *arariza*, as well as *melekaproum*, *erestios*, *lestitis*, *pyxionyx*, *dardanon*, and *iontitis*; the Gauls call it *theximon*, the Egyptians *sophoeph*, the Sicilians *chamaimēlon*, the Italians *terra mala*, the Dacians *apsinthion chōrikon*. It grows in mountainous country, in warm and flat places or rough and rocky areas. It "works" in the treatment of an oppressive fever in this way: [have the patient] with fever [breathe the odors] from a charcoal fumigator with birthwort [on it], and the fever will subside. And applied as a plaster, birthwort cures wounds. With nut grass (*Cyperus rotundus* L., possibly a galingale, *C. longus* L.) and the tuber of the dragon arum (*Dracunculus vulgaris* Schott)[47] and honey, it helps [Paris, Venice, and Salamanca MSS: "cures" Vienna 16 MS and Vatican MS] those with carcinomas of the skin. Boiled in oil, or pig's fat, and rubbed on, it is a treatment for periodic shivering fevers [Paris, Venice, and Salamanca MSS end here]. And Crateuas the Rhizotomist and Galen [or Galos] have said the same things [El Escorial MS ends], and it also helps those with gout.[48]

This commentary is more complete than many others on Dioscorides: it has synonyms, plant habitat, and medicinal usages. Wellmann thought that this scholium had come from the Pseudo-Apuleius *Herbarius*.[49] While there are similarities, the Byzantine commentator's source is not the *Herbarius*, a work in Latin composed perhaps in the fourth century, and not, as previously believed, based on an original Greek work.[50] The list of synonyms resembles that in the *Herbarius*, but there are notable differences.[51] Pseudo-Apuleius has no recommendation for gout, and prescribes *clematitis*-birthwort for nasal carcinoma[52]—probably a polyp of the

[42] M. Wellmann, *Krateuas* (Berlin, 1897 [AbhGöttingen, Phil.-hist.Kl., n.f. 2, no. 1]).

[43] Vienna, Nationalbibliothek MS med. gr. 1 (= Anicia Juliana MS), fol. 27^{r}, published as Crateuas fragment No. 5 in Wellmann, ed., Dioscorides, Vol. III, p. 145.

[44] E.g., the discussion of asphodel in Galen, *Properties of Foods* II, 55, and *Mixtures and Properties of Simples* VI, 77 (ed. Kühn, VI, 651–52, and XI, 842), and the fragment of Galen in the Vienna Anicia Juliana MS, fol. 27. Cf. Paul of Aegina VII, 3 (ed. Heiberg, Vol. II, p. 198). For Hippocratic works, see Dierbach (n. 16 above), 99–100.

[45] Munich, MS lat. 337, fol. 66^{v}–7, published by H. Stadler, "Dioscorides Langobardus," *Romanische Forschungen*, 10 (1897), 238–39.

[46] Dioscorides III, 4.5 (ed. Wellmann, Vol. II, p. 8).

[47] The scholiast's δρακοντίου σπέρματος is probably to be rendered "tuber," given the manner of reproduction of the dragon arum.

[48] Schol. Dioscorides III, 4.5 (ed. Wellmann, Vol. II, p. 8: *app. crit.* to line 10). This is appended in at least the following MSS: *Vatican MS Pal. gr. 77; Vienna, N.B., MS gr. 16, 15th cent.; *Paris, B.N., MS gr. 2183; *Salamanca, MS 2659; *Venice, San Marco, MS Gr. Z 271; El Escorial, MS T–II–12.

[49] Ed. Wellmann, Vol. II, p. 8: *app. crit.* to line 10 init.

[50] H. E. Sigerist, "Zum Herbarius Pseudo-Apulei," *SA*, 23 (1930), 197–204, esp. 200.

[51] Pseudo-Apuleius, *Herbarius* 19 (ed. Sigerist, p. 57, lines 24–27), has the following synonyms not found in the Greek scholium: *feuxicterus*, *erectitis*, *Itali opetes*. The Greek scholium has ἰοντῖτις and θέξιμον, not found in the Latin *Herbarius*. Also variant is *Dardani sopitis*, cf. χαμαίμηλον. Both the Byzantine scribe and the author of the *Herbarius* apparently employed the same source. For an early study of plant synonyms, especially those appearing in the Anicia Dioscorides manuscript, see M. Wellmann, "Die Pflanzennamen des Dioskurides," *Hermes*, 33 (1898), 360–422.

[52] *Herbarius* 19.7 (ed. Sigerist, p. 57, lines 20–22): *Ad carcinomata, quae in naribus nascuntur. Herba aristolochia cum cipero et draconteae semen cum melle inpositum emendat.*

nares, usually a benign tumor in the nasal passage, displaying a pedicle, especially on the mucous membrane. Most of the medicinal suggestions in the commentary originated in the Crateuas fragment found in the Anicia Juliana on two separate folios,[53] and from Galen who clearly borrowed from Crateuas for the description of birthwort.[54] The major difference in the Byzantine scholium is the use of the herb for skin carcinomas (ἐν ῥινὶ καρκινώμασι). Byzantine diagnostics certainly did not include malignant neoplastic lesions as in modern oncology, but there is little doubt that they suffered from various kinds of malignant cancers,[55] and one of several terms to describe them was καρκίνωμα.[56] Recently, aristolochic acid, found in *Aristolochia baetica* and *A. clematitis*, was discovered to have antitumor properties,[57] and currently it is employed in chemotherapy for cancer.[58] It seems that a Byzantine physician, in or before the fourteenth century, had discovered *clematitis*-birthwort's pharmaceutical properties in use against skin cancers, and the scribe thereby modified the Greek text derived from Crateuas and added the scholium to Dioscorides' account, writing that *klēmatitis* "helps" skin cancer. Significantly, another copyist strengthens the claim by changing the verb from "helps" to "cures." This last alteration is correct, as judged in 1983, a fact we have had to rediscover. In early modern employment of the plant in Europe, it was apparently not used against cancer, but its history requires further research.[59]

There is a similar scholium attached to Dioscorides' account of βολβὸς ἐδώδιμος, one of the grape hyacinths, and most likely tassel hyacinth (*Muscari comosum* [L] Miller).[60] At the end of *Materia medica* II, 170.2, the scribes of three manuscripts have appended:

> [tassel hyacinth] boiled with barley meal[61] and pig's fat causes οἰδήματα and φύματα quickly to suppurate and break up.[62]

Oidēmata and *phymata* are two other Greek terms for tumorous growths or lumps, the lexical range of which include our "malignancies," "carcinoma," and "sarcoma."[63] An extract from the bulb of tassel hyacinth is currently used in chemotherapy for cancer.[64]

Not all commentaries and scholia attached to Dioscorides are rational or even empirical. Appended to the same group of manuscripts which include the tassel hyacinth scholium is a short text at the end of Dioscorides' clipped description of the herb called *mōly* (prob. *Allium* spp.):[65]

> The roots being cut and gathered up and carried next to the body, *mōly* helps against drugs [or poisons: φάρμακα] and frees one from his enemies.[66]

In this case, the Byzantine scholiast may have borrowed from the anonymous first- or second-century work called *Carminis de viribus herbarum*,[67] a collection of poems retailing quasi-magical properties of certain herbs. Even if the scholium can be traced to an ultimate source in Greek from the early Roman Empire, the data has been filtered and changed through centuries of transmission.

In other instances, the contents of the commentaries are apparently new, and one may also judge them rational. The same manuscripts that have the scholium on *mōly*, as well as the Anicia Juliana, also

[53] Vienna, Nationalbibliothek, MS med. gr. 1, fols. 18 and 19^{v}; printed as Crateuas, Frgs. Nos. 1 and 2 in Wellmann, ed., Dioscorides, Vol. III, p. 144. A Galen fragment on *klēmatitis* is in fol. 19^{v} of the Vienna MS, but it also does not include the statement on *karkinōma*.

[54] Galen, *Simples* VI, 56 (ed. Kühn, XI, 835–36).

[55] D. Brothwell, "The Evidence for Neoplasms," in D. Brothwell and A. T. Sandison, eds., *Diseases in Antiquity* (Springfield, Illinois, 1967), 320–45, using the findings of paleopathology. See also J. Reedy, "Galen on Cancer and Related Diseases," *Clio Medica*, 10 (1975), 227–38.

[56] L. J. Rather, *The Genesis of Cancer* (Baltimore, 1978), 9.

[57] G. E. Trease and W. C. Evans, *Pharmacognosy*, 11th ed. (London, 1978), 98 and 577; S. Munavalli and C. Viel, "Etude chimique, taxonomique et pharmacologique des Aristolochiacées," *Annales pharmaceutiques français*, 27 (1969), 449–64 [463]; *Chemical Abstracts*, 80 (1974), 24780g for *A. baetica*, and 81 (1974), 111458z for *A. clematitis*. Cf. earlier uses as listed in *Dispensatory of the United States*, 25th ed. (Philadelphia, 1955), 1841.

[58] Lewis and Elvin-Lewis, 134.

[59] Schneider, *Lexikon* (n. 25 above), Vol. V, pt. 1, 124–29.

[60] Dioscorides II, 170 (ed. Wellmann, Vol. I, pp. 236–37); Berendes, trans., *Dioskurides*, p. 247; Carnoy, 51.

[61] ἄλφιτον.

[62] Schol. Dioscorides II, 170.2 (ed. Wellmann, Vol. I, p. 237: *app. crit.* to line 14).

[63] Rather, *Genesis of Cancer* (n. 56 above), 9–13.

[64] Lewis and Elvin-Lewis, 135.

[65] J. Stannard, "The Plant Called Moly," *Osiris*, 14 (1962), 254–307, traces the remarkable history of plants called by this name in Greek. Cf. Schneider, *Lexikon* (n. 15 above), Vol. V, pt. 1, 65, and B. Langkavel, *Botanik der spaeteren Griechen* (Berlin, 1866; rptd. Amsterdam, 1964), 12.

[66] Schol. Dioscorides III, 47 (ed. Wellmann, Vol. II, p. 61: *app. crit.* to line 2).

[67] E. Heitsch, ed., *Carminis de viribus herbarum fragmentum*, 179–91 (esp. 190–91) in *Die griechischen Dichterfragmente der römischen Kaiserzeit*, Vol. II (Göttingen, 1964), pp. 35–36; Stannard, "Moly" (n. 65 above), 286; Wellmann, ed., Dioscorides, Vol. II, p. 61: *app. crit.* to line 2 (accepting the *Carminis de viribus*—known in Wellmann's day as *Carmen de herbis*—as the source).

have added details on κρόμυον) or onion (prob. *Allium cepa* L.).

> Thus boiled and laid on in a plaster with stavesacre (*Delphinium staphisagria* L.) or fig, onion softens and breaks up tumors (φύματα) very quickly.[68]

Modern Chinese medicine employs the onion for its anti-tumor properties,[69] and western folkmedicine uses it as a stimulant for the nervous system.[70] The scholium also suggests stavesacre, which contains a strong alkaloid which may have anti-tumor properties as do many alkaloids, but no ancient author on pharmacy recommends the onion for treatment of tumors.[71] Therefore, this discovery can be assumed to be early Byzantine, since the addendum on onion for tumors is first found in the Anicia Juliana manuscript.[72]

Some of the scholia are botanical, but clearly with a medicinal purpose. Dioscorides had written that the stem of the reedmace, a kind of cattail (prob. *Typha latifolia* L., possibly *T. angustifolia* L.) was smooth and uniform;[73] a Byzantine scribe added "the stem white, uniform."[74] Modern botanical manuals describe two types of spikes for *T. latifolia*, a female which turns brown, and a male which forms a yellow spike but which later falls off to leave a slender, colorless terminal axis,[75] so that the Byzantine addition of "white" probably aided identification.

Some of these manuscripts[76] have added a habitat description to Dioscorides' ἄκανθα Ἀραβική, with "It grows in rugged places." Sprengel believed that Dioscorides' "Arabian acanthus" was *Onopordon arabicum* [= *acanthium* L.], but Berendes thought it was no particular species, simply "acanthus" from Arabia.[77] Dioscorides says only that "Arabian acanthus" is similar to "white acanthus," identified as a thistle,[78] and several other plants.[79] A larger number of species passed under the name of "acanthus," as recorded in Theophrastus.[80] The illumination of the "Arabian acanthus" in the Anicia family of Dioscorides manuscripts, as well as the textual description are, however, more appropriate for *Onopordon acanthium*, Scotch thistle, sometimes also called cotton thistle from its fluffy purple flowers.[81] Scotch thistle grows on waste ground, which is in keeping with the "rugged places" in the scholium. Whatever might have been Dioscorides' intent regarding the plant, the Byzantine commentator most likely understood the description as that of Scotch thistle, and so described its habitat, since this was omitted in Dioscorides' text. In a modern herbal, Scotch thistle is recommended as an astringent,[82] the same use as given by Dioscorides, which makes the identification of Scotch thistle appropriate in its pharmacognosy. Not surprisingly, the Byzantine scribe is seeking clarity in the confusing nomenclature of plants called "acanthus," and his appended remark would be helpful.

In correcting Dioscorides' description of "wild isatis," a Byzantine scholiast shows remarkable botanical observation, surpassing by far Dioscorides. In this instance, moreover, the scribe says that Dioscorides is wrong. From a modern perspective, Dioscorides is not incorrect as the Byzantine scho-

[68] Schol. Dioscorides II, 151.2 (ed. Wellmann, Vol. I, p. 217: *app. crit.* to line 7).

[69] Bin Hsu, "Use of Herbs as Anti-Cancer Agents," *American Journal of Chinese Medicine*, 8 (1980), 305.

[70] *Dispensatory* (n. 57 above), 1538. Cf. V. E. Tyler, Lynn R. Brady, and J. E. Robbers, *Pharmacognosy*, 8th ed. (Philadelphia, 1981), 482, who write: "Further chemical and pharmacologic research is needed to determine the real value of garlic and onion for the many conditions in which they are reputed to be effective."

[71] No such recommendation appears in the Hippocratic corpus, Galen, Aetius of Amida, and Theophrastus, among the Greek sources, and none appears in Latin in the tracts by Pliny, Gargilius Martialis, Pseudo-Apuleius, and Scribonius Largus.

[72] The copyists of the early sixth-century Anicia Juliana MS, or an earlier prototype (the text is also in Naples, N.B., MS suppl. gr. 28, 7th cent.), were apparently of the opinion that Dioscorides had not given enough attention to plants of the genus *delphinium*, of which stavesacre is one species. After δαῦκος (Dioscorides III, 72) in the original order, the Anicia Juliana and the Naples MSS add two more plants, called δελφίνιον and δελφίνιον ἕτερον, along with descriptions. Venice, San Marco, MS Gr. Z 273 (12th cent.) is a fragmentary Dioscorides in the regular order, and this allowed Wellmann to discern the chapter's proper position in Dioscorides' work. Book III in the Venice MS begins on folio 21.

[73] Dioscorides III, 118 (ed. Wellmann, Vol. II, p. 129); Berendes, trans., *Dioskurides*, p. 342; Carnoy, 271.

[74] Schol. Dioscorides III, 118 (ed. Wellmann, Vol. II, p. 129: *app. crit.* to line 3).

[75] Polunin, *Flowers of Europe*, nos. 1827–28.

[76] Schol. Dioscorides III, 13 (ed. Wellmann, Vol. II, p. 20: *app. crit.* to line 11). *Vatican, MS Pal. gr. 77; *Paris, B.N., MS gr. 2183; *Venice, San Marco, MS gr. Z 271; Vienna, Nationalbibliothek, MS gr. 16; and El Escorial, MS III–R–3. The first three MSS also have the scholium to Dioscorides III, 118.

[77] Berendes, trans., *Dioskurides*, 271.

[78] *Ibid. Cnicius ferox* L; Langkavel, *Botanik* (n. 65 above), 74.

[79] E.g. *Acacia albida* Delile; *Cnicius arvensis* Hoffm. = *Cirsium arvense* (L.) Scop.; Carnoy, 3.

[80] Theophrastus, *HP* IV, 2.8 (tree); IV, 10.6 (creeping thistle, prob. *Carduus* [= *Cirsium*] *arvense* [L.] Scop.); IX, 12.1 (pine thistle, *Atractylis gummifera* L.), *etc.*

[81] Polunin, *Flowers of Europe*, no. 1494.

[82] M. Grieve, *A Modern Herbal* (New York, 1931; 2 vols.; rptd. 1971), Vol. II, 798.

liast alleges, but the scribe apparently believes that Dioscorides was describing a plant other than the one we now think he intended. Knowing it to be wrong, the Byzantine commentator hoped to correct the description with details so exact that we can be virtually certain which plant he intended.

Dioscorides devotes one chapter to woad (ἰσάτις [*Isatis tinctoria* L.]) and another to "wild woad" (ἰσάτις ἀγρία),[83] which modern authorities agree is another species of woad, while disagreeing on the exact nomenclature.[84] He writes that the plant is similar to ordinary woad except that it has larger leaves, like lettuce, but with slender stems which are reddish and multi-branched, on the end of which hang many tongue-like pods containing the seeds, the flowers being yellowish and small.[85] Modern descriptions add only that woad has petals up to twice as long as the sepals.[86] The Byzantine scribe believes he is correcting Dioscorides as he writes:

> One must consider faulty the information on woads. The cultivar (ἡ ἥμερος) bears a quince-yellow flower, thinner and greatly subdivided branches, and little pods from the top which are like tongues, in which are the seeds; but there is enclosed in these a black seed like black cummin (μελάνθιον, *Nigella sativa* L.),[87] and its stalk grows to a height of over two πήχεις (c. 3 ft./95 cm.), not to a height of a πῆχυς (c. 1½ ft./47 cm.). The wild kind, however, bears blacker leaves than the cultivar, and the wild kind has a shorter and thicker stalk, a purple or blue flower, and a prickly fruit shaped like a cross, in which the seed is as if divided into five equal small leaflets.[88]

The scholiast's description compares well with technical, modern depictions of cow basil (*Vaccaria pyramidata* Medicus) and its flowers, stalk, ovary, and seeds.[89] The Byzantine commentator observes that the seed pod has five small equal leaflets, and the *Hortus Third*, a modern botanical reference, says "epicalyx absent, calyx 5-lobed, 5-winged, inflated petals 5 . . . seeds nearly globose."[90] By contrast, woad's seed is black, but flat and pendulous, and does not compare to the seed of black cummin in the manner of cow basil's seed. In summary, this scholium reveals excellent attention to botanical detail rarely equaled in ancient or medieval herbals. Although the scholiast probably has mistaken Dioscorides' intended plant, he has boldly and explicitly written that Dioscorides was wrong and proceeded with his corrections. The unknown Byzantine commentator has trusted his observation of the plant in nature in a way that his western counterpart would not have done.

Byzantine commentaries on Dioscorides are apparently carefully pondered, and their contents are rationally constructed corrections and supplements to the text. A certain number of them are clearly derived from classical authorities, but most seem to be the results of Byzantine medicine's experience with the drugs mentioned in Dioscorides' *Materia medica*. By comparison, the manuscripts of the Old Latin Translation of Dioscorides reveal clumsy copyist errors by scribes who knew little about the material they were handling. It was not until the late eleventh century, when Constantine the African (or someone from his school) rearranged the Old Latin Translation in alphabetical order, that a large scale,[91] rationally designed set of commentaries were attached to Dioscorides' Latin text. By contrast, the Byzantine commentaries were more modest, but generally of a high medical and botanical quality. These Byzantine scholia show the purpose toward which Dioscorides' works were directed: medicine. The texts were not exclusively warehoused in isolated monastic libraries awaiting a Renaissance dusting. They must have been used by physicians.

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[83] Dioscorides II, 184 and 185 (ed. Wellmann, Vol. I, pp. 253–54).

[84] Berendes, trans., *Dioskurides*, 258, with list of suggested spp.

[85] Dioscorides II, 185 (ed. Wellmann, Vol. I, p. 254).

[86] Polunin, *Flowers of Europe*, no. 292. *Hortus Third*, 606.

[87] Cf. Dioscorides III, 79 (ed. Wellmann, Vol. II, pp. 92–93).

[88] Schol. Dioscorides II, 185 (ed. Wellmann, Vol. I, p. 254: *app. crit.* to line 11). *Vatican, MS Pal. gr. 77, and Paris, B.N., MS gr. 2182 end with οἰονεὶ διειλημμένον (line 8 of scholium); but three earlier MSS add five further lines (as printed by Wellmann).

[89] Polunin, *Flowers of Europe*, no. 182; *Hortus Third*, 1142.

[90] *Hortus Third*, 1142.

[91] J. M. Riddle, "The Latin Alphabetical Dioscorides," *Proceedings of XIIIth International Congress of the History of Science, Moscow, August 18–24, 1971* Sections III & IV (Moscow, 1974), 204–9, and Riddle, "Dioscorides," *Catalogus*, 23–27.